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SCIENCE NEWS LETTER

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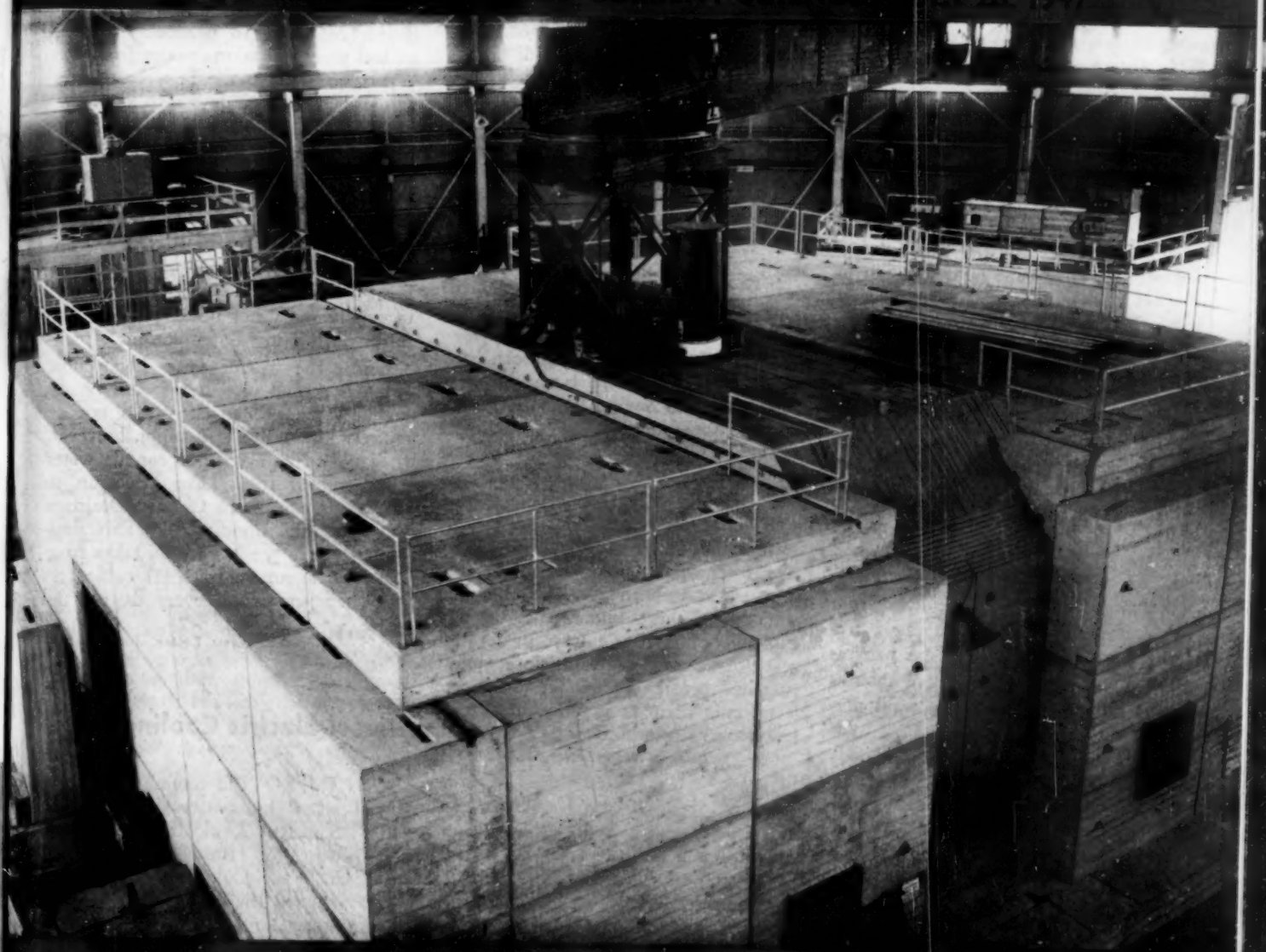
THE WEEKLY SUMMARY OF CURRENT SCIENCE JULY 26, 1947



Roman Sarcophagus

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A SCIENCE SERVICE PUBLICATION

MEDICINE

Cramped Before Birth

Dislocation of hip, club foot, and other deformities can be traced to cramped positions of the baby in the womb. Some of these abnormalities can be corrected.

➤ WHEN A BABY is born with deformities such as clubbed-feet, dislocated hip or back-knee, it may be due to the position he had to take in his rather cramped quarters before birth, Dr. Charles Chapple of Children's Hospital, Philadelphia, told delegates to the Fifth International Congress of Pediatrics in New York.

The so-called congenital dislocation of the hip, he declared, is not really a dislocation, although hips can be dislocated before birth. The one called congenital, Dr. Chapple stated, is really only a persistence of the cartilage state of the hip of the unborn baby. It has not ossified, or become bony, enough to support muscle pull and weight bearing. The condition is due to relaxation of the hip joint capsule to the point where it does not provide enough pressure stimulus for the conversion of cartilage to bone.

Although the baby's mother may not notice the condition, the doctor can diagnose it, usually after the first week when the initial relaxation period has disappeared. Pinning the diaper to the sheet to keep the leg and hip in proper position, called abduction, or a simple abduction splint will let the bone form very rapidly. If the condition is recognized and treated before the baby is three months or at most five months old he has a good chance to walk normally and early.

Before the baby is born, his body movements are restricted by his close quarters within the womb. He cannot stretch his arms and legs and has to adapt to whatever position he is in as the womb wall encroaches on him. He does this by relaxing his joint capsules. Often an arm or leg is trapped.

After the baby is born, he still prefers the position to which he has become accustomed, uncomfortable as it may appear. This is true even when his arms are locked under his legs or the legs themselves are extended beside the face. Sometimes a joint has had to be dislocated for the baby to adapt to the available space in the womb. When this has happened, the baby is happier in that posture than after the dislocated arm or leg has been placed in its proper position.

This preference of the newborn baby for his position before birth, however contorted, is so obvious that Dr. Chapple calls these contortions "positions of comfort." Newborn babies will almost invariably fall asleep in them.

Maneuvering newborn babies into their "positions of comfort" as a routine examination position shows the probable mechanisms involved in deformities such as clubbed-feet, back-knee and abnormally short under jaw. It also explains otherwise unexplained stiffness of certain joints, since joints stretched before birth seem to become less elastic than normal for at least a few months after birth.

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CIVIL ENGINEERING

Dams for Domestic Needs

➤ CONTROL and utilization of water in arid and semi-arid regions must adhere to the principle that the highest use should be for domestic consumption and the growing of crops, the American Society of Civil Engineers was told at Duluth, Minn., by Col. W. W. Wanamaker of the Army Engineer Office, Garrison, N. D.

The army officer described the newly undertaken Garrison Dam project on the Missouri river. The giant reservoir made by the dam will extend a distance of 200 miles upstream. The project is designed to adhere to the above principle. Its primary purpose is to capture spring floods, and release the water later for irrigation, also for navigation, power and stream sanitation. The use for power and navigation would be secondary.

The dam to be built will be the world's largest rolled-earth-fill structure, containing about four times the material in the Denison Dam on the Red river between Oklahoma and Texas. This is the world's largest dam of this type at the present time, he stated.

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River Water Diversion

Diversion of water from one river to another was described at the same meeting as working like a blood transfusion into an ailing person by M. W. Torkelson of the Wisconsin Planning Board, Madison. In particular he described plans for taking water from the Wisconsin river to the Fox river for a period of about 120 days each year.

The Wisconsin river flows generally southward through central Wisconsin until it makes a westward turn and empties into the Mississippi. The Fox, to its east, finally empties into Lake Michigan. Its lower section is highly industrialized with factories that use great quantities of water. The plan is to supply the water needs of these factories during low-water seasons.

Under the scheme some 1,500 cubic feet per second of water would be diverted when needed. It would not be entirely lost to the Mississippi, however. It would make up in part for the water now drained from Lake Michigan to the Mississippi by the Chicago Drainage canal and the Illinois river. This shipping canal to the Mississippi takes from Lake Michigan about 1,500 cubic feet of water per second every day of the year.

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ENGINEERING

Diesel-Electric Cooling

➤ AN IMPROVED cooling system for diesel-electric locomotives is the subject of U. S. patent 2,423,929, issued to T. B. Dilworth of Hinsdale, Ill., and M. M. Schalla of Oak Lawn, Ill. They have assigned their rights to the General Motors Corp.

Air is admitted through shuttered louvers on the sides of the locomotive, passes the cooling radiators, and is vented through a short stack at the top by means of a blower. Thermostatic controls open the shutters as the machinery heats up, close them again as it cools off.

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RADIO

Talking into Your Radio

You will be able to operate a two-way radio into which you can talk by 1948. It will be neighborhood and short-range service.

➤ YOUR OWN personal radio—the kind you can talk into, not just listen to—is in the making. Sometime in 1948 you will be able to buy and operate, by permission of the Federal Communications Commission, a compact transmitter-receiver—if you really need this new "citizens radio service" kind of communication.

Fifty manufacturers and experimenters are actually talking on the alloted 460-470 megacycle band under experimental licenses. About 500 small portables are already in use by police, firemen, foresters, geologists and motion picture producers. Experience in the operation of widespread personal use of two-way radio without interference with other radio services is being obtained.

Radio engineering advances made during the war are helping to speed the day when such personal radio-telephone sets can be bought and when the FCC will allow them to be used. Printed wire circuits, in which metallic paint on plastic or ceramic plates replaces conventional soldered wires, will contract and lighten the new sets. Miniature tubes, such as used in the famous wartime proximity fuzes, will be the electronic hearts of some of the sets. Some of these tubes will replace three or more tubes of conventional prewar radio sets. Just as these radio advances are about to appear in more compact hearing aids and conventional FM radio broadcast receivers, so they will be basic to the citizens radio service sets.

The war surplus "walkie-talkies" dramatized in the war just won't work in the new service. These sets were made to operate on radio frequencies that could be used in the war theaters overseas but can't be used here at home because they interfere with marine, police, fire and other radio services. To change their frequencies would cost too much; it is cheaper to build new and better sets taking advantage of the improved methods of making radios.

Manufacturers are not yet ready to guess at what these citizens radio service sets will cost. Probably they will be in the price class with the better kind of living room radio, but they will be rugged and finished for wear rather than primarily for looks. They will be portable and therefore lightness in weight will be desirable.

You can't yet apply for a license to operate a citizens radio because the rules and regulations are not yet drafted by the FCC. The new service probably will not be legalized before early next year.

Some rancher who wants to talk to his home from his roaming jeep may be the number one licensee of citizens radio service. Or a doctor may want sets to keep in touch with his office as he makes his calls. The week-end skipper of a pleasure boat may be an early CRS applicant. And a lumbering company may wish to install a system of its own to keep in contact with crews in the woods.

Government officials working on the new system expect citizens radio service to become one of the largest branches of radio in many ways. It will be neighborhood and short-range service as the distance that it will operate over will not be large. Eventually there may be ways to call a special station within range that will relay the voice over regular telephone lines, thus extending the range of these little radio stations so that they can reach all parts of the world wherever telephone service extends.

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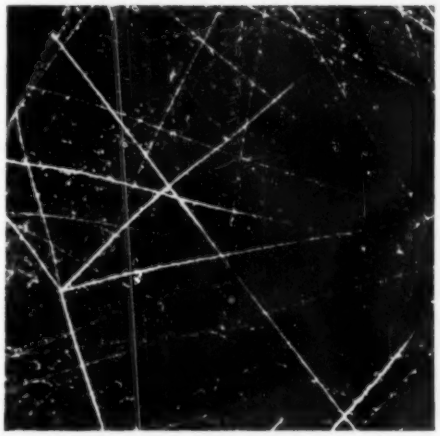
NUCLEAR PHYSICS

Concrete Covers Cyclotron To Absorb Dangerous Rays

See Front Cover

➤ THE GIANT new cyclotron at the University of California is now "buried" in a five-foot-thick sarcophagus of concrete which absorbs the dangerous radiation created during its operation.

As the intensity of the 100 million electron volt neutron beam is increased, the thickness of the wall will be doubled. Of all the substances tested, including water, paraffin, graphite, aluminum, lead and copper, only the latter was more effective than concrete. However, copper was impractical because of the expense.



ATOM SPLITTING—Cloud chamber photograph shows disintegrations of atomic nuclei caused by 100 million electron volt neutrons. The neutrons passing through the chamber cannot be seen, though their effect can be photographed. Each prong of the five-pointed star represents a particle being emitted from an oxygen nucleus disintegrated upon being struck by a 100 million electron volt neutron. The heaviest tracks are caused by alpha particles. The lighter ones are protons and electrons.

The five-foot wall cuts the intensity of the neutron beam down to one hundredth its original strength, which is sufficient protection against the present intensity of the beam, according to Dr. B. J. Moyer, physicist in the radiation laboratory.

The cyclotron's sarcophagus is composed of 98 concrete blocks, averaging 20 tons each and totaling about 2,000 tons. Its dimensions are 20 feet high, 65 feet long, and 55 feet wide.

The neutron beam is so powerful, however, that it can be detected faintly when a Geiger counter is held behind the concrete at the point the beam emerges from the cyclotron.

The 4,000-ton atom-smasher hurls atomic projectiles of 10 times greater energy than any previous heavy particle accelerator.

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A kerosene product known as *savasol* kills weeds and almost every garden vegetable except carrots; it is extensively used in carrot raising.

GENERAL SCIENCE

Science Foundation Closer

Only about one more legislative step is necessary to bring about the establishment of a National Science Foundation with funds for research.

➤ A NATIONAL science foundation should begin speeding basic research in America within a few months.

The passage of a national science foundation bill by the House on July 16 after about three hours of debate is almost the last legislative step toward the civilian agency to back science for peace and future emergencies in much the same way that science was applied to the war.

The bill as passed by the House differs in only a few major ways from the bill the Senate passed in May. An attempt to put into the House bill on the floor the provisions that would earmark a quarter of the expected appropriations for the tax-supported colleges in the various states was defeated 81 to 33. Since this provision favored by the land grant colleges was inserted in the Senate bill on the floor of the Senate, it is likely to be eliminated when the Senate and House conferees meet.

The key man in the actual operation of the foundation will be the director. The Senate bill provides that he be nominated by the President and confirmed by the Senate, while the House bill has him appointed by the foundation. The final bill may bow to the Presidential appointment, as a recognition that the foundation is a part of the executive branch of the government.

President Truman is known to be very strong in his opinion that the foundation should be an effective and responsible agency within the government. However, it is not expected that his preference for presidential appointment of the director would keep him from signing the bill even if the House provision is in the final version.

The bill itself does not appropriate any money. There may not be time for an appropriation this session of Congress. This will not necessarily stop the foundation from getting underway. Organizational funds could probably be transferred from some existing appropriation.

When the director has qualified and been in office for 30 days under the bill, the foundation would take over what is left of the war-time Office of Scientific Research and Development. This agency received $90,000 for the current fiscal year. While it is a mere pittance compared with the hundreds of millions it spent during the war, this sum would probably allow the foundation to get organized and save several precious months. In research, a few months of saving of time may be the difference between success and failure.

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CHEMISTRY

Ultraviolet Radiation Can Change 2,4-D's Power

➤ULTRAVIOLET radiation can change the plant-killing power of 2,4-D and the various commercial compounds in which it is usually sold. This has been demonstrated in tests made by Drs. Merle G. Payne and Jess L. Fults of the Colorado Agricultural Experiment Station.

They exposed small batches of 2,4-D and half-a-dozen of its compounds to carefully adjusted amounts of ultraviolet irradiation. Then they made up solutions of both treated and untreated samples and applied them to pea seedlings used as vegetable guinea-pigs in their experiments.

In general, irradiation increased the killing power of 2,4-D and most of its compounds, although the record is spotted with cases where it had the opposite effect. The ammonium salt of 2,4-D was weakened in almost all tests.

These tests, the two researchers point out, were made on commercial preparations, because it was of practical importance to get an immediate answer. If chemically pure preparations had been used, the results might conceivably have been different; such tests are recommended.

The tests, Drs. Payne and Fults add, "suggest a possible explanation of the variable results secured from uniform trials of 2,4-D and similar compounds at different times and places. Since the amount of ultraviolet light reaching the earth varies with change in atmospheric conditions, altitude and season of the year, the herbicidal effects might be expected to vary accordingly. Field tests to settle this question are suggested."

Details of the experiments are reported in *Science* (July 11).

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The so-called "Santa Fe" *architecture* of adobe houses in the American Southwest originated in Indian homes built of sun-dried earth blocks, or of sticks and mud, long before white settlement.

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MEDICINE

Shots of Drugs "Aimed"

The same drug can be directed to any organ needing the treatment by "aiming" it. Particles are the right size for cells. TB treatment hinted.

➤ AN "AIMED SHOT" method of giving drugs with a hint that it may provide a method of treating tuberculosis, is being reported by Dr. Rudolf Degkwitz, of the University Children's Clinic, Hamburg, Germany, at the meeting in New York of the Fifth International Congress of Pediatrics.

By "aiming" the injections, one and the same drug can be directed exclusively either to the spleen, liver, lungs or bone marrow, according to need. The trick seems to be having the drug in such physical form that particles of it are the right size and shape to be taken up by the cells of the sick organ.

Aniline dyes dispersed in the form of very small spherical particles in water were injected into guinea pigs infected with tuberculosis. With weekly injections, the animals survive after six to seven weeks of treatment, Dr. Degkwitz reported, while untreated control animals die within this period of time.

Examination of tissues or single cells by means of polarized light, which showed crystalline or crystalloid structures within the cells, apparently gave the clue to the "aimed" injection method of treatment.

A particular group of compounds, water-soluble fats, within the protoplasm of cells, Dr. Degkwitz found, apparently favors crystallization while another group, water-soluble sugars and proteins, prevents crystallization.

With the aid of these two antagonists, spheres, needles, flakes and fibers of well-defined diameters may be produced from the same drug in the test tube by first allowing it to crystallize and then interrupting crystallization after a certain time.

When a drug is injected into the blood stream, spheres and particles of a certain diameter will be taken up in the liver, spleen or bone marrow. Needle-shaped particles with longitudinal diameters similar to red blood cells will remain in the lungs. Spherical particles injected into cavities (abdominal or pleural) will be transported by the lymphatic vessels and will accumulate in the lymph nodes.

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REFLECTORS ON BUOYS — A buoy wearing a radar reflector can be picked up by the ship's radar at twice the distance than when the buoy alone is the target.

MEDICINE

Synthetic Cheer-Up Drug

➤ NEW MEDICAL weapon in the fight against mental sickness is a synthetic cheer-up drug that lifts patients out of depressions. Its use in 50 patients of whom 36 showed definite improvement is reported by Dr. G. Tayleur Stockings, Ernest Hart Memorial Scholar of the British Medical Association.

The drug is called synhexyl. It was synthesized by an American chemist, Prof. Roger Adams of the University of Illinois. Similar chemicals have been synthesized by Prof. A. R. Todd of Cambridge University and the Roche Research Department in England.

Synhexyl, also known as pyrahexyl, or parahexyl, is somewhat like cannabis, the drug extracted from the hemp plant. Under the name of hashish, cannabis has figured in romantic tales of the East throughout history.

As a cheer-up drug, which doctors call a euphoriant, synhexyl is more powerful, weight for weight, than cannabis, Dr. Stockings found from experiments on himself and a group of normal persons.

It is not very powerful as a painkiller but under its cheering influence, patients were less disturbed by their aches and pains.

"An extremely promising" remedy but not a "permanent cure," is Dr. Stockings' verdict on the drug after trying it on patients. It is not a cure because its effect is not lasting and it must be given every day.

The patients took the drug in a capsule first thing in the morning before breakfast. The patients who were helped by it said they felt brighter, more cheerful and more confident. They showed more initiative and interest in work or other activities. Some had already had electroshock treatments without being helped by them.

Inert, control capsules of exactly similar appearance did not have any effect on the patients, thus ruling out the possibility of the improvement being due to suggestion. Bad side effects from the drug were at a minimum and Dr. Stockings believes the drug could be given to patients who are not in a hospital.

U. S. Doctors Fear Hazards

Giving synhexyl, or parahexyl, to patients not in hospital would be completely contrary to the experience doctors at the U. S. Public Health Service Hospital in Lexington, Ky., have had with it. This hospital, popularly known as the "narcotic farm," has been carrying on extensive studies of morphine and many other drugs that might cause addiction.

"In a certain proportion of patients parahexyl sets off an acute, excited, temporary psychotic (insane) condition," Dr. Victor Vogel, director of the hospital said.

"It should therefore be given under closely controlled conditions."

Doctors here are not familiar with its use for treatment of depressions.

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MEDICINE

Benadryl Treats Hives

This new drug that is used for hayfever treatment relieves hives, or urticaria, by lessening itching and reducing swelling. It is given by mouth.

➤ BENADRYL, a new drug that has come into use in treatment of hayfever, is now pronounced "highly effective" in the treatment of hives.

Drs. Paul A. O'Leary and Eugene M. Farber, of the Mayo Clinic in Rochester, Minn., report to the medical profession through the *Journal of the American Medical Association* (July 19), that some patients who have had chronic hives for years, trying unsuccessfully a large array of therapies, were relieved within a few hours by swallowing small doses of Benadryl.

The drug was also very effective in acute cases of urticaria (which is what doctors call hives) caused by some medical injection or something a person has eaten. Usually an attack of such temporary hives subsides in a few days or weeks, but relief from the itching occurs in 20 to 60 minutes after the first dose of Benadryl is taken and the swelling is reduced in 2 to 6 hours.

In 35 patients with such acute hives, 20 were completely relieved in one to two days, 12 were improved with itching reduced and fewer and smaller wheals and three patients were not benefited.

Those with chronic hives must continue to take the drug to prevent the trouble from recurring. Of 75 chronic urticaria patients, 48 were entirely relieved while they were taking Benadryl, 17 had fewer lesions and less itching, and 10 obtained no benefit. A third of the patients had some harmful reactions to the drug, but only a few were sufficiently severe to stop the use of the drug.

Two other conditions that involve skin swelling and produce stiffness and inability to move one's fingers responded to Benadryl treatments. These ills are known as scleroderma and acrosclerosis.

The drug is given by mouth and Drs. O'Leary and Farber recommend that the treatment should begin with small doses administered three times a day, increasing gradually to discover what regular dose is needed to relieve the condition.

Benadryl is a white powder that has the chemical name, betadimethyl aminoethyl benzohydryl ether hydrochloride, and it is manufactured by Parke Davis and Company.

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AAF'S LARGEST—Army's new 12-person helicopter, all metal, has rotors that overlap as they turn much like the blades of an egg-beater; the Kellett XR-10 has speed of over 100 miles an hour.

AERONAUTICS

Twin-Engined Helicopter Carries Twelve Persons

➤ THE U. S. ARMY has a new helicopter. It is its largest craft of the helicopter type, and can carry 10 passengers in addition to pilot and copilot. It features overlapping rotors.

It is of all-metal construction, a twin-engine affair, with two sets of rotors placed relatively close together and lifting blades that overlap as they turn, somewhat like the blades of the ordinary household egg-beater. This arrangement eliminates the need for a separate rotor at the tail to counteract torque or any tendency to get off its forward course.

The new helicopter, to be known in military circles as the XR-10, is a product of Kellett Aircraft Corporation, North Wales, Pa. Flying tests have already been completed. It has a maximum forward speed of over 100 miles an hour, and a range of 350 miles at a cruising speed of 90 miles an hour.

While the best known helicopters are one-engine craft with limited passenger capacity, there are other twin-rotor helicopters. One is a Navy craft, built by the P-V Engineering Forum, Inc., Philadelphia. This is an elongated craft, resembling somewhat a suspended rowboat, with rotors at the front and rear ends. It carries a total of 12 persons, including pilot and assistant.

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BOTANY

Rubber Tree Seedlings Seem Immune to Disease

➤ RUBBER TREES that seem resistant to the destructive leaf-spot disease have been brought out of the jungles of Brazil by Prof. J. T. Baldwin, Jr., of William and Mary College, and introduced into cultivation at the Instituto Agronômico del Norte at Belém.

They belong to a different species from *Hevea brasiliensis,* the disease-susceptible plantation rubber tree. Their botanical name is *Hevea rigidifolia;* the species is not nearly so abundant as its cultivated cousin.

As actual yielders of latex, the new trees have little value. However, because they can be crossed with the plantation rubber tree species there is hope that they can be used in breeding to render the latter more resistant to leaf-spot disease.

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ELECTRONICS

Plastic-Embedded Radios

Warborn plastic protects radios and electronic equipment potted in it. NBS casting resin was used to house printed wire circuits.

➤ "POTTED" radios and electronic equipment, embedded in a plastic for protection against rough handling and atmospheric conditions, will open new fields for electronic devices in industry and the home, scientists at the National Bureau of Standards predicted.

The forecast was made with the disclosure of a secret warborn plastic, developed for "potting" electronic circuits. One use of the plastic was to house the flat, printed wire electronic circuits of the radio proximity fuze.

The clear, transparent plastic is called NBS casting resin. It meets the special mechanical and electrical requirements of a material for shielding delicate tubes and circuits without interfering with the operation of the electronic equipment.

Six different chemical compounds are used in making the plastic which may one day hold your own pocket radio or hand-sized radio sending and receiving set.

In casting, or "potting," a radio or electronic circuit, the liquid casting resin is poured over the circuit in a container. Curing in an oven converts the liquid plastic into a smooth, clear solid.

When glass tubes are to be embedded in the plastic, the tubes are protected by rubber jackets or other covering before being cast.

NBS casting resin was developed by chemists P. J. Franklin and M. Weinberg of the Bureau of Standards.

Protected by the casting resin, now-fragile electronic devices can find many more uses. As well as rigidly embedding the circuits, the plastic provides excellent electrical insulation.

In addition to small radios, which could be protected by the plastic and tuned by a pin or screw, other applications predicted for the casting resin include hearing aids and subminiature electronic control devices. In heavy industry, the transparent material can be used to shelter high-impedance control devices. NBS casting resin shields the circuits from vibraton, acid fumes, high humidity, salt spray and other conditions which are encountered in some industries.

The casting resin is nearly one-third 2,5-dichlorostyrene by weight, with slightly more than 20% each of poly 2,5-dichlorostyrene and styrene monomer. Hydrogenated terphenyl and polystyrene each form more than 10% of the plastic's weight, with one-half of one percent of a solution containing 60% divinylbenzene.

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BIOCHEMISTRY

Thyroid-Slowing Drug Grows Longer Feathers

➤ CHICKENS can be made to grow sickle and saddle feathers two or three times as long as usual by feeding them a small quantity of the thyroid-slowing drug, thiouracil. These exceedingly long feathers are very narrow. Often the feather is twisted so that parts of both the front and back can be seen at the same time.

To discover how the so-called "Japanese long-tailed" fowl was induced to grow such extraordinarily long feathers, Prof. Mary Juhn and Prof. M. A. Jull, department of poultry husbandry of the University of Maryland, experimented with the diet of several hybrid fowl. The greatest increase in length occurred in the long, curved sickle feathers and near-by back feathers known as saddle feathers.

When one of the roosters was six months old, they pulled out several typical feathers for later comparison, then placed the fowl on a thiouracil diet. As little as one-half per cent of the drug by weight was added to the regular mash on which the bird had been fed. Within nine months the two main sickle feathers, normally about 14 inches long, each measured 25.5 inches. And more important yet, they were still growing. Several months later one of the feathers had been lost, but the other had obtained its full growth of 33.5 inches.

Experiments with another cock showed that the saddle feathers produced by a bird that had been treated with thiouracil for a long time tended to become longer than those grown when the rooster was newly placed on the diet.

DRUG-GROWN — Short feather is a mature sickle feather produced by a hybrid cock. The long sickle feather, measuring 33.5 inches, was produced by the same fowl during the time he was fed the drug.

Oriental birds, famous for their long feathers, receive special care and are closely caged, the scientists state in a report to the *Journal of Heredity*. They are fed with great care, being given unhusked rice, cabbage and other vegetables.

Although these birds have undoubtedly been bred to produce long feathers, some item in their diet, possibly cabbage, may have an effect similar to the drug and be important in achieving the feather lengths. Systematic pulling on the feathers probably would not increase the length, they suggest.

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INDUSTRY

Shipping Clams

➤ CLAMS can be shipped all the way from Alaska to the Pacific Northwest and arrive in edible condition, when treated by a process described by Prof. Cecil G. Dunn of the Massachusetts Institute of Technology. The shucked clams are first dipped into a mixture of brine and sodium benzoate, then packed in crushed ice. In this condition they keep their flavor and are free of spoilage for two weeks.

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MEDICINE

World-Wide 'Flu Epidemic Could Start at Airports

➤ A WORLD-WIDE influenza epidemic like that of 1918-19 may get started at one of the staging areas for international air travel, Dr. Stuart Mudd, professor of bacteriology at the University of Pennsylvania, warns.

Conditions he saw on his own air travels to Russia last summer are the basis of his warning, appearing in a report in *American Scientist* (July 15).

He and Mrs. Mudd, he relates, were grounded by bad weather at Shannon and again at Gander. There they found scores of people from every part of Europe and America mingled in common rooms, all breathing the same confined air. As they breathed it, they exchanged microbes that each had harbored in his nose and throat, brought from home or picked up on his travels.

If any of these microbes belonged to a strain capable of causing disease, all the travelers would have been exposed to it.

Within a few days, as they continued on their travels, they would be spreading the disease germs all over Europe and the Americas. The spread would have been so far and so fast that it would be impossible to protect populations by vaccination. Some of the germs might be of a kind against which there is as yet no vaccine.

The situation, Dr. Mudd declares, is so serious that the World Health Organization and the international airlines should take action.

There is a remedy for it. This is to disinfect the air by ultraviolet lights or germ-killing vapors. "Adequate installations of ultraviolet radiation or of germicidal vapors in all staging bases," Dr. Mudd states, "would greatly reduce the probability of an epidemiologic catastrophe, should another respiratory disease agent like that of the 1918-19 influenza pandemic appear in the future."

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METALLURGY

Manganese for Steel Near Shores of Old Seas

➤ NEW FACTS about the ores of manganese, chemical element important in alloy steels, were discovered through years of research and won for Dr. A. Betekhtin one of this year's Stalin Prizes.

Exploration of manganese deposits during and since the war has been aided by Dr. Betekhtin's finding that sediments of ancient seas are richer nearer their shores in manganese suitable for making ferro-manganese, which is an essential in steel making. As the old sea basins increase in depth, the manganese deposits lessen in oxygen content and have more of other elements, such as phosphorus, which makes them less desirable for metallurgical use.

An exhaustive study by Dr. Betekhtin on "Manganese Ores of the U.S.S.R." has been published. His fundamental researches were done upon the noted Chiatury manganese deposits of the Georgian Soviet Republic.

Science News Letter, July 26, 1947

RADAR

Chemical Smoke To Stop Radar Waves Predicted

➤ CHEMICAL SMOKE that can stop radio waves as present-day smokes stop light, thus sharply limiting the usefulness of radar, is the prediction of Col. M. E. Barker, commandant in the U. S. Chemical Corps School. Writing in *Chemical Corps Journal* (July) he points out how radar had made concealing smokes largely useless by the end of the war, being used to direct artillery fire at invisible targets.

The comeback of smoke, to stop radar, he pictures as a smoke "that will bounce a radar beam like a duck's back turning a thin stream of water. That means that smoke is going to be mighty effective even against guided missiles, as well as against gun-laying and bombing radars. You can't go to sleep in this scientific race or you will find your long-range missiles being returned to base instead of proceeding to the expected target."

Col. Barker also foresees the return of poison gas, which was absent from World War II. But there'll be changes made—radioactive ones: "Certainly all will have to be prepared against it, and that is going to be some job when arsenic, phosphorus and sulfur can be made highly radioactive and so impart this property to war gases in addition to the usual toxic qualities. . . . Radioactive toxic gas may be even more effective against strategic targets than atomic bombs."

Science News Letter, July 26, 1947

IN SCIEN

ENGINEERING

Liquefying Natural Gas For Small-Space Storage

➤ A CHEAP method of converting natural gas into liquid form for storage in small-space tanks was revealed by Northwestern University. Under the new method 800 cubic feet of gas can be stored in one cubic foot of space.

The development is the result of studies by Prof. L. F. Stutzman and Instructor George H. Brown of the University's Technological Institute. Basically the process reduces the temperature of natural gas to 260 degrees below zero Fahrenheit by bringing it into contact with liquid nitrogen at a temperature of minus 320 degrees.

Through the use of refrigeration equipment and insulated storage tanks, they show that large storage tanks of the sort now used for holding natural gas can be eliminated, or used perhaps to hold for immediate use gas obtained from the liquid form. The liquid gas is returned to vapor form merely by reducing refrigeration. The method of liquefying can be used in oil fields to save gas now allowed to escape because of present costs of recapture and shipping.

Science News Letter, July 26, 1947

BACTERIOLOGY

Viruses Protect Plants From Bacteria in Soil

➤ BACTERIA that cause plant diseases are seldom found in the soil, though fungi and other troublemakers often lurk there. Dr. R. C. Thomas, of the Ohio Agricultural Experiment Station, believes he has found out why.

Bacteria are plants, though very small ones, and like all other plants are subject to virus diseases. Viruses that prey on plant-disease-causing bacteria, Dr. Thomas states, are formed in soil when organic matter is present. The bacteria are not necessarily killed, but they at least lose their virulence. Soils poor in organic matter harbor lower concentrations of these particular viruses, hence the bacteria are more likely to survive in them.

Science News Letter, July 26, 1947

NE FIELDS

BIOCHEMISTRY

Growth Hormone Speeds Penicillin Production

➤ PENICILLIN production from a given batch of mold has been more than doubled through the addition of a few hundredths of one per cent of phenylacetic acid, by Drs. R. D. Coghill and A. J. Moyer of the U. S. Department of Agriculture, working at the Northern Regional Research Laboratory at Peoria, Ill. The same effects are obtainable also with salts and esters of the acid, they state in the preamble to patent 2,423,873.

At the same laboratory, Dr. S. A. Morell has developed a method for converting furfural, the now well-known "make-all" compound derived from oat hulls and corncobs, into tertiary amino pentanols and their esters. These are useful as intermediates in the preparation of certain drugs. His method has received patent 2,424,184.

Rights in both patents are assigned royalty-free to the government.

Science News Letter, July 26, 1947

MEDICINE

Fast Work of Cold Germs Halts Antibodies' Action

➤ THE REASON people go on catching colds and having attacks of influenza all their lives seems to be a matter of time. How this time factor comes into the picture was explained by Dr. Colin MacLeod, of New York University College of Medicine, at a recent conference at the Army Medical Center in Washington, D. C.

Influenza and the common cold are caused by germs of the virus class. But curiously, certain virus diseases never attack the same person more than once. Chicken pox, measles, mumps and smallpox are examples Dr. MacLeod gave.

The outstanding difference between these diseases, he pointed out, is in the incubation period. That is the period between the invasion of the body by the germs or virus and the development of the sickness. The virus diseases against which permanent immunity is obtained, the kind, that is, which attack only once, have incubation periods ranging from seven to 26 days.

Resistance or immunity to disease depends on something called antigens. They may come from a disease germ or virus that invades the body on its own, or from the "shot" the doctor gives to protect against certain diseases. The antigen brings about production of antibodies to the disease by the body itself. Certain cells of the body apparently are detailed for this work. An antigen rouses them to action but this requires from seven to 10 days.

From then on, however, these antibody-producing cells remain on the alert. Their response to a second and very much smaller dose of the antigen will be much greater and much quicker —generally in from three to six days. That is fast enough to stop measles or mumps. But in the case of colds, grippe, 'flu and the like, with their very short incubation periods, even the much faster reaction is not fast enough. The malady can become established before the antibodies can get under way.

Science News Letter, July 26, 1947

CIVIL ENGINEERING

National Water Policy Urged for Better Program

➤ A NATIONAL policy for water conservation and use was advocated at the meeting in Duluth, Minn., of the American Society of Civil Engineers by W. W. Horner, consulting engineer of St. Louis.

"Water is as much a national resource as the country's minerals and just as valuable to the national economy and safety," he said. "It is unthinkable that we can continue indefinitely to suffer life and property losses, just because our irrigation, flood control, navigation, power and other programs are a hodgepodge."

The national policy would replace present "piecemeal development of water programs," and eliminate jurisdictional conflicts and confusion. The policy would be worked out by a committee of expert civil, mechanical, electrical, mining and chemical engineers. It would define positions of all subdivisions of government in a cooperative effort between states and federal government; with the public protected and assured of economic planning and construction of water projects by unbiased review by engineers who have no continuing interest in such developments.

Science News Letter, July 26, 1947

CYTOLOGY

Nerve Experiments Show Cells Grow Near Center

➤ CELLS DO all their growing in the immediate neighborhood of their nuclei, or centers of physiological activity. The new-grown living substance then migrates to the outside of the cell.

Evidence in support of this concept was presented before the Sixth International Congress of Cytology in Stockholm by Prof. Paul Weiss of the University of Chicago. It was obtained in a study of growth in nerve cells, which are peculiarly well suited for the purpose because nerve fibers, no matter how long, are integral parts of the cells from which they extend. Prof. Weiss and his co-workers found that nerve fibers renewed their worn-out substance and increased in length entirely by the migration of new living material from the cell nuclei .

Another phenomenon on which Prof. Weiss reported is induction, the specific influence by which one tissue imposes a definite character on a neighboring tissue. Past experiments in induction have been carried out with living tissue, but in Prof. Weiss' laboratory it has been demonstrated that the same effect can be obtained with tissues killed by freezing and drying. Frozen-dried cartilage induced growth of new cartilage at spots where it was grafted on.

Science News Letter, July 26, 1947

MYCOLOGY

Course of Wood Decay By Molds Is Traced

➤ WHEN MOLDS cause the decay of wood, there is a definite series of chemical steps, stated Prof. F. F. Nord of Fordham University before the Sixth International Congress of Cytology in Stockholm. These steps are: cellulose to glucose to ethyl alcohol to acetic acid to oxalic acid. What happens to the other main constituent of wood, lignin, is not so clear.

For a time it was thought that one complex compound, methyl-p-methoxycinnamate, resulted from the breakdown of lignin because it resembles other compounds that can be derived from that substance. Prof. Nord's studies, however, show that one organism can act on wood sugars, glycerol and ethyl alcohol, to produce it. This compound also, therefore, comes from the cellulose fraction of wood.

Science News Letter, July 26, 1947

ASTRONOMY

Great Square Guide in Skies

Regular grouping will be in the east in the constellation of Pegasus, the winged horse. Meteor shower will occur Aug. 12.

By JAMES STOKLEY

➤ TO THE EAST on August evenings appears one of the most conspicuous of those regular groupings of stars that serves as a useful guidepost in finding one's way about the heavens. This is the "great square," most of which is in the constellation of Pegasus, the winged horse. Its position is indicated on the accompanying maps, in which is shown the appearance of the heavens at 11:00 p. m., daylight saving time, around the first of August, and an hour earlier in the middle of the month. The square is now resting on one corner and the star at the left, named Alpheratz, is in the neighboring constellation of Andromeda, the chained princess. Next to her, farther left, is the figure of her mother, Cassiopeia, shaped like a letter W on one side. Cepheus, her father according to the old myth, is just above.

Near Little Dipper

This constellation is close to the little dipper, directly north, and part of Ursa Minor, the lesser bear. Polaris, the pole star, is at the end of the handle of the little dipper and is indicated by the well-known "pointers," the two stars in the bowl of the big dipper, seen in the northwest. This, in turn, is part of Ursa Major, the great bear. Winding around between the big and little dippers is the sinuous line of stars marking Draco, the dragon.

Directly above the square of Pegasus, we find Cygnus, the swan, sometimes called the northern cross. First magnitude Deneb is at the top of the cross, toward the north. Below the southernmost star, at the bottom of the cross, we see Altair, in Aquila, the eagle. And above—directly overhead, as shown on the maps—is Vega, in Lyra, the lyre, which is the brightest star now visible at night.

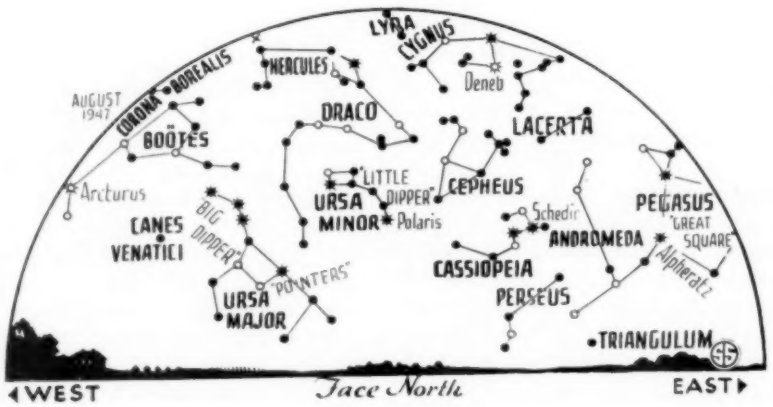
Still more brilliant, however, is the planet Jupiter, which is low in the southwest in the constellation of Libra, the scales. Next to this group, toward the left, one finds Scorpius, the scorpion, of which the ruddy first magnitude star Antares is part. Directly above this figure appears the large constellation of Ophiuchus, the serpent bearer, and the two parts of Serpens, the serpent he is carrying, one to the right, which is the head end, and the terminal end toward the left. Continuing upwards from Ophiuchus we reach Hercules, the strong man of mythology. He is represented, rather inappropriately, by a group of six stars in the shape of a butterfly! The butterfly is facing the west, with one wing to the north and the other to the south. In the western edge of the northern wing, represented by a small cross on the map, one can see a faint spot of light on a dark night, which is really a great globular cluster of stars.

In addition to Jupiter, two other planets can be seen at other times on August nights. About four hours before sunrise Mars appears in the east, in the constellation of Gemini, the twins. Still later, in the early part of the month, the rarely-seen planet Mercury may be glimpsed. On Aug. 3 it is farthest west of the sun and one may see it low in the east, just under the stars Castor and Pollux, of Gemini, the twins. Saturn and Venus, the other two planets that are bright enough to be seen without a telescope, are both too near the sun at present to be viewed.

On any clear night one occasionally sees a flashing point of light commonly termed a "shooting star." Actually, these are not stars at all, but meteors—small bits of cosmic dust that enter the earth's atmosphere and then are quickly burned by the friction they encounter. Many millions of these come into the atmosphere daily, but the vast majority are vaporized and never reach the ground. Occasionally one is large enough to survive until it lands and then it is called a meteorite. According to a Canadian authority on meteors, Dr. Peter M. Millman, of the University of Toronto, on the basis of an overall average for the year a single observer would be able to see ten meteors an hour on a clear night with an unobstructed view of the sky. These conditions are not often realized for most of us, so that generally not more than one or two an hour can be observed. However, at certain times of year there are meteor "showers," and one of these occurs during August, with the maximum on Aug. 12. Then one might be able to see a meteor every couple of minutes, especially after midnight, for then they are most numerous. In the early morning hours, the earth meets them head-on, while those we see in the evening have to catch up to us.

Meteors from Perseus

The meteors that appear in August, called the Perseids, seem mostly to come from the direction of the constellation of Perseus, the champion, which appears on the map low in the northeast, but rises higher later in the night. Actually they are moving around the sun in parallel paths and on account of perspective these seem to converge in the direction of Perseus, from which they are coming. The swarm goes completely around the sun and follows the orbit of a faint comet seen in 1862, so they are apparently some cometary debris. The



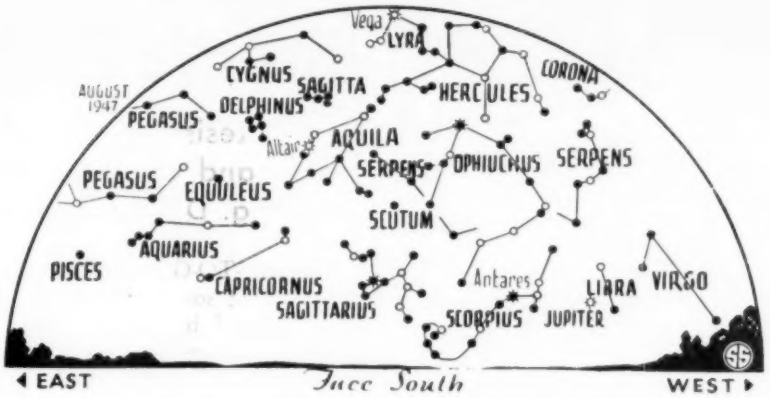
earth's orbit intersects that of the meteors at the place we occupy in August, and that is why the meteors are seen at this time. Of course, the sky must be dark to observe them best. Since the moon is at last quarter this month on Aug. 9, it will rise late on the 12th during the early morning hours, and will hardly be bright enough to interfere seriously, though its light will cut out some of the fainter meteors.

Astronomers appreciate the help of amateurs in observing meteors. A simple but useful task is to count the total number that you see during half hourly intervals, as from midnight to 12:30, 12:30 to 1:00, etc. Such counts may be sent to Dr. Charles P. Olivier, at the Flower Observatory, Upper Darby, Pa., or in Canada to Dr. Millman, at the Dominion Observatory, Ottawa.

As noted in the first part of this article, it is possible to see a faint patch of light in the constellation of Hercules (indicated by a cross on the map), which is a great globular cluster of stars, at least 100,000 in number. This object is at a distance so great that its light (at the speed of 186,000 miles per second) takes 35,000 years to reach us. At such a distance our sun would be invisible with even the most powerful telescope.

About a hundred of these globular clusters are known, and the work of Dr. Harlow Shapley, of the Harvard College Observatory, has shown that they form the skeleton of the huge system of stars called the galaxy of which the sun is a member. Most of the stars are in a flat, grindstone shaped disk. However, the hundred globular clusters form a system that is spherical in form, but sharing the same center as the main galaxy itself.

Centuries ago men thought that the earth was in the center of the universe, but then it was shown that the earth is but one of the planets revolving around the sun. Later, as the idea of the galactic system was formed, it was thought that the sun, and our solar system with it, was near the center of the grindstone, but the work on the globular clusters demonstrated that this was wrong. It was observed that most of these clusters are in one half of the sky, but if we were at the center they would be more uniformly distributed in all directions. Actually, we are tens of thousands of light years away from the center of the galaxy, which lies toward the constellation of Sagittarius, the archer, now visible in the southern sky.



Celestial Time Table for August

August	EST	
1	8:50 p. m.	Full moon
3	3:00 p. m.	Mercury farthest west of sun
5	1:00 p. m.	Saturn and sun in line
9	3:22 p. m.	Moon in last quarter
12	early morning	Perseid meteors
	4:47 p.m.	Moon passes Mars
15	3:00 a. m.	Moon nearest, distance 223,300 miles
	5:09 a. m.	Moon passes Mercury
16	6:12 a. m.	New moon
22	12:47 p. m.	Moon passes Jupiter
23	7:40 a. m.	Moon in first quarter
27	11:00 a. m.	Moon farthest, distance 251,900 miles
31	11:34 a. m.	Full moon

Subtract one hour for CST, two hours for MST, and three for PST.

Add one hour for the corresponding Daylight Saving Time.

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GEOGRAPHY

Importance of Greece

▶ TROUBLED GREECE, now bolstered by American dollars and threatened by alleged Red sympathizers on the north, is a tiny nation as nations go but it happens to occupy a strategically important spot far out of proportion to its size.

In area it is smaller than Alabama, and in population a million or so less than New York City. But it and its thousands of islands are so situated that Greece is in a position to dominate the eastern Mediterranean, the Adriatic with its ports that serve much of Central Europe, and the Aegean sea which in turn controls the shipping lanes to the Dardanelles and the Black sea.

In shape, it is somewhat like a broad-bladed sickle with its narrow handle separating Bulgaria and Yugoslavia from the Aegean. The end of the handle is against Turkey-in-Europe. Albania is at the butt of the blade, and the blade itself projects into the Mediterranean between the Adriatic and the Aegean. A broken-off point of the blade is the Greek island of Crete that limits entrance to the Aegean to relatively narrow shipping lanes on its west and east.

Another factor in Greece's position is that it is the only non-satellite nation in Europe east of the Soviet line of control which now extends from the Russian-occupied area of Germany on the Baltic sea south to the Adriatic. Control of Greece would give the Soviet Union control of shipping ports to the Mediterranean, and make it easier for it to gain control of the waterway from the Black sea through the Bosporus, Sea of Marmara, and the Dardanelles.

Albania, Yugoslavia and Bulgaria, all to the north of Greece, have reasons of their own for wanting to control all or parts of Greece. Bulgaria and Yugoslavia want to extend to the Aegean. Albania wants to extend its border. Yugoslavia has ports on its west coast but for many reasons wants ports to the east. Bulgaria's only present ports are on the Black Sea.

Another factor in the situation is the desire of the Macedonians to be an independent nation again. The territorial claims of these people of very ancient stock is the part of Greece on the north shores of the Aegean, and parts of what are now Bulgaria and Yugoslavia. A committee of Macedonians, made up of citizens of the United States and Canada, are urging an "autonomous Macedonia."

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Do You Know?

Moistened baking soda will remove tea and coffee *stains* on china cups.

The export of American *medicinals* is a rapidly growing trade.

Raw oatmeal added to drinking *water* gives a distinctive taste and is said to prevent cramps.

A hundred million *visitors* have entered the New York zoo since its opening 48 years ago.

A new *pipe-smoking* champion kept a single bowlfull of tobacco alive for nearly 88 minutes by taking "frugal whiffs."

Belgium's *sand dunes,* which stretch along the coast from the Netherlands to France, cover an area about 15 square miles in extent.

The search for a substitute for *rubber* was begun by the English physicist, Michael Faraday, as early as 1826, it is said.

Ammonia gas is applied to soil as a nitrogen *fertilizer* from tractor-mounted tanks through nozzles five inches below the surface that follow cultivator plows.

Approximately 4% of *Belgium* is land reclaimed from the sea; about 40% of its total area has an elevation less than 300 feet above sea level.

American steel *scrap* salvaged in Europe is sold only for return to the United States; there is a shortage of scrap in the domestic steel industry.

Federal financial aid to the states for *road construction* is now 30 years old, but advisory aid has been available since 1893, when the old Office of Road Inquiry was established.

Entertainers mystify audiences by talking with helium-filled lungs; this *gas* has a density one-seventh that of air and it raises the resonance frequencies of the mouth to change the voice to a comedy falsetto.

CIVIL ENGINEERING

Buyers Delay Construction

Resistance to prices is holding up the building of plants and facilities important to producton and manufacturing. Different viewpoints presented.

➤ READY-TO-GO construction projects, totaling some $10,000,000,000, are being delayed by buyers' resistance to other commodity and service prices, the American Society of Civil Engineers was told in Duluth, Minn., by Forrest W. Parrott, Sioux City, Iowa, who is president of the Associated General Contractors of America.

The construction projects referred to include the enlargement of present factories and the building of new industrial plants, also many other types of facilities that play a part in America's production, transportation and manufacturing programs.

In addition to the $10,000,000,000 worth of construction now in blue-print form, another $40,000,000,000 worth is in other stages of planning, he said. Construction costs may decline gradually to what can be considered new normal levels, but "they cannot return to levels prevailing before the war unless the nation suffers an economic catastrophe."

The public should not be led to believe that there will be quick and drastic reductions in construction costs, he declared. The present "increase above prewar costs is about the same as the general average for most other services and commodities."

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Cost Reduction Essential

A somewhat different viewpoint was presented to the engineers by A. O. Babb of the U. S. Reclamation Service. Construction costs, he said, must be reduced to meet conditions under which "contractors allegedly are pricing themselves out of a juicy market, and owners and government engineers face costs that exceed the economic return of projects, or the unwillingness of the taxpayer to pay."

"If the construction industry, as a group, is to have any effect on our economy . . . it must, through cost analysis and control, keep the slope of the construction cost index just a little better than the others. Contractors today are not competing with each other for jobs nearly as much as they are competing for dollars with other industries."

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Research May Lower Costs

A building industry research program, seeking technological methods to increase efficiency and lower costs, was detailed by J. C. Stevens of Portland, Oreg. "Improved methods and materials offer an effective answer to the charge . . . that the construction industry is pricing itself out of the market."

Steps have been taken to organize a national building research advisory board, under the National Academy of Sciences. Dr. Frank B. Jewett, ex-president of the Academy, has agreed to serve as its chairman. The board would collect available information relating to building construction, evaluate it without bias, and circulate it to builders and others interested.

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CHEMISTRY

Process Makes Plastic From Bituminous Coal

➤ A GROUP of British inventors under the leadership of Donald Hugh Bangham of London have developed a process for making molded plastic articles simply by applying high pressure to powdered bituminous coal, at moderate temperatures.

The preferred temperature is about 345 degrees Centigrade, which is intermediate between the lower "tarry-softening" and the higher coking temeratures. Preferred molding pressures range between 4,500 and 6,700 pounds per square inch. Various fillers may be included if desired.

The product is glossy black, glassy in texture, does not make black streaks when rubbed on paper. It can be used for electric insulators, containers for corrosive chemicals, etc.

Rights in the patent, No. 2,424,012, are assigned to C. D. Patents, Ltd., of London.

Science News Letter, July 26, 1947

State Science Fairs and Searches

A Report to Science News Letter Readers

➤ THE THIRD of a million boys and girls who belong to the more than 14,000 clubs affiliated with Science Clubs of America are discovering that scientists and educators are seriously interested in helping them to become scientists.

Generosity of scientists toward promising young scientists is no new phenomenon, but this essential meeting of the experienced and inexperienced has never been so widespread and well planned before.

The feeling of responsibility on the part of adult scientists to encourage the boys or girls who shortly may be their assistants or co-workers has been gaining momentum steadily in the last decade.

This year, relieved of pressing wartime duties and responsibilities, scientists and educators have turned attention to the business and pleasure of giving promising youth the incentive that can come only from mutual understanding between individuals who "speak the same language."

In the 37 states now cooperating with Science Clubs of America, a Science Service activity, in this catalytic process of helping students to help themselves, the methods used are as interesting and varied as the individuals concerned.

Two highly successful methods have emerged: the Science Fair and the State Science Talent Search.

Science Fairs

➤ THOUSANDS of young scientists have brought the results of this year's work to science fairs. Well-known scientists have judged their efforts and awarded prizes to the best of them. Fairs provided powerful incentives for individuals to complete their experiments and present them publicly. They brought beginning and mature scientists together. They gave the public a chance to see new developments in science, graphically and skillfully explained by boys and girls. Most important of all, fairs gave each young scientist the inspiration and enthusiasm that is bound to result from meeting others of his own age working on similar problems.

Here are a few illustrations of successful science fairs:

Pittsburgh

The Buhl Planetarium was the scene again of the Pittsburgh School Science Fair held April 19 through May 3. Now in its eighth year this Fair has constantly improved its quality until now any exhibitor can take pride in being admitted to show his work there. Sponsored by the Planetarium and the PITTSBURGH PRESS, the Fair attracts students and visitors—more than 7,000 in the first week—from all western Pennsylvania and provides the climax of a year-round program of stimulation of science by educational, scientific, industrial and youth organizations in that area. Awards range from medals and cash to college scholarships and job recommendations.

New York City

The American Institute of the City of New York held its 14th School Science Fair Dec. 7-11 at Madison Square Garden after a wartime lapse of several years. The Fair attracted entrants from all schools in the metropolitan area. School classes roamed its exhibit-packed aisles during the day. The public by thousands studied it during the evening hours. Cash awards bolstered the budget of many a boy and girl and made possible bits of laboratory equipment and material needed to make a better exhibit for next year.

Providence, R. I.

The Second Annual Rhode Island Schools' Science Fair was the high spot of the season for young scientists in that area. Educational and scientific agencies of all kinds in the state cooperate with the PROVIDENCE JOURNAL in making this affair a thrill to the public as well as an event of real educational value to the exhibitors. From April 8 through 11 a total of 15,000 jammed Hope High School in Providence to see 576 exhibits from all parts of the state. Public, private and parochial schools recognize the event as one of important educational stimulation. Judges from the state and other states and scientists of note invited for the evening programs make this a week of great importance to the students and the public.

Washington, D. C.

The first annual Washington Science Fair was held in the Nation's Capital May 19-23 under the auspices of a committee of educators and scientists. More than 400 exhibitors of all ages showed their work at the Department of Commerce auditorium. Judges were scientists of national and international renown, who reported after several hours of button pushing and wheel turning that they had not had so much fun in years. The public enjoyed the same sport during the daytime and evening hours.

Buffalo, N. Y.

The Buffalo Museum of Science held its Fifth Annual Science Congress and Fourth Annual Buffalo Salon of Photography this year. Over 600 young scientists came from all parts of western New York. Youthful speakers and photographers were awarded cash, books, medals, trophies and trips to points of scientific interest. Planning and awards came from scientific, civic, industrial and educational organizations in that area.

➤ MORE information about cooperation with Science Clubs of America may be obtained by writing to Science Clubs of America, 1719 N St. N.W., Washington 6, D. C.

Talent Searches

➤ ABOUT 16,000 high school seniors this year entered the Sixth Annual Science Talent Search for the Westinghouse Science Scholarships, sponsored by Science Clubs of America, administered by Science Service and made financially possible by the Westinghouse Educational Foundation. From this number 40 were named as winners and 260 received honorable mention. In addition, a large number of other very fine students were cared for by several states that considered them for state awards. Some of the State Science Talent Searches already reported are:

Georgia

A committee of judges appointed by the Georgia Junior Academy of Science chose five from 23 entrants in the national competition to receive state honors and awarded each $50. All of the boys were recommended to Georgia colleges and universities for scholarship consideration.

Illinois

While four students from this state were winners in the national competition and 13 others were named for honorable mention, the Illinois State Academy of Science considered others worthy of honors and named a total of 31 for state honors. Nine different colleges and universities in that state gave them outright scholarships or other financial assistance that will enable them to continue their science education.

Iowa

The Iowa Junior Academy of Science honored nine students out of the 56 that entered the national competition. These nine were offered full tuition freshman scholarships at Iowa State College. These scholarships were created for the first time to make it possible for these promising students to go on with their studies.

Louisiana

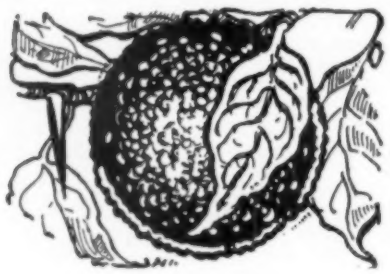
A committee of the Louisiana Academy of Science selected three boys for state honors. Two of them had also won honorable mention in the national competition. All were recommended to colleges and universities in the state for scholarship assistance.

Virginia

The Virginia Academy of Science, conducting their Science Talent Search for the second time, narrowed their 120 contestants down to 42 by requiring each of them to show their work at one Open House at any of six colleges and universities in the state. From the 42 the committee selected 15 for state honors. Each received a $50 savings bond and assistance in gaining entrance to the school of his choice within the state. Five of the 15 had won honorable mention in the national competition. All were entertained by the Academy at its two-day state meeting.

AGRONOMY

NATURE RAMBLINGS
by Frank Thone



Technological Unemployment

➤ THE INVENTION of the cotton gin made cotton the South's principal crop. The steel plow and the reaper hastened the shift of the grain belt from the hills of the East to the prairies of the West. The linotype and the rotary press, by greatly cheapening printed matter and thus increasing its use, have created a crisis in forestry, with easily accessible native stands of timber being wiped out faster than new pulpwood is being grown.

In a little less obvious way, the invention of barbed wire has caused the near-disappearance of the Osage orange, a once familiar high shrub or small tree.

When the prairie lands of the Midwest were being opened up, a century or so ago, the most easily available way of dividing field from field, and keeping stray cattle on the road from getting into the corn, was to plant a hedge. Neither the rail fences made of split logs from cleared land farther east, nor the stone walls of the Atlantic seaboard, were practicable on the prairies, where there were few trees and even fewer stones.

Most practical hedge plant was the Osage orange. It is a native plant, with its center of distribution in the Ozarks and nearby regions, so it was readily available and already acclimated. It grows rapidly and branches freely if cut back, so can be induced to form a thick, stout hedge in a short time. And it is armed with most formidable thorns, discouraging to would-be animal trespassers.

Early nurserymen grew great stocks of it, and sold young plants by the millions. From the sixties to the nineties of the last century there were literally thousands of miles of Osage hedge. If you went for a buggy-ride in the country, you were almost continuously "hedged in" by the thick shrubs, trimmed waist-high, on both sides of the road.

Then somebody conceived the idea of putting steel thorns on twisted wire, and invented a machine for making the stuff. A barbed-wire fence took less space than a hedge, which of course claimed several yards of soil on either side of itself for its own nutrition. This materially increased the tillable area of each field.

So the hedges began to decline. Farmers dug them out, or hired professional crews with steam-powered machinery to root them up with giant plows. The smoke of their burning drifted over all the land.

Here and there, stretches of hedge still survive, usually neglected and allowed to grow to full height of 20 or 30 feet. But they are only fragments of what was once the empire of the Osage orange.

Science News Letter, July 26, 1947

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GEOGRAPHY

Falklands' Good Location

➤ THE BRITISH have in the Falkland islands a stake to bargain with Argentina for food and markets. From the ordinary economic viewpoint, these forestless, sheep-raising small islands have little value. On the other hand, however, they have strategic value to both nations.

The Falkland islands, with a total area about the size of New Jersey, are some 250 miles east of southern Argentina. With natural harbors, capable of development, the group could become a marine center to protect the Argentina coast and to control traffic from the Atlantic to the Pacific by way of the Straits of Magellan, or on the open route around Cape Horn.

To Britain, the Falklands have proven naval value. It was from their hidden harbors that a British fleet, which was re-coaling, rushed out to meet and defeat a German fleet in December, 1914. This event marked the end of a definite phase of World War I at sea.

In these days of increasing interest in the South Polar region, the islands have another value. They are on the route from England to the South Pole by way of the British-owned South Shetlands and South Orkneys. The latter group is a final take-off station to explore the Antarctic. The Falklands are a way station.

The Falklands, over the ownership of which England and Argentina are now in dispute, are as far south of the equator as the British Isles are north. Together with the Shetlands and other islands in that neighborhood, they are Britain's most southerly possessions. The United Kingdom's claim is based on discovery (in 1592), settlement, ownership for many years, and because of its Scottish population. Argentina's claim is based largely on proximity and need.

There are over 100 islands in the group but only two, East Falkland and West Falkland, are large enough to have value. These contain about 3,000 and 2,300 square miles of area, respectively. Their total population is in the neighborhood of 3,000 persons. The principal town is Stanley, on the land-locked harbor within Port Williams, on the east coast of East Falkland.

Science News Letter, July 26, 1947

INVENTION

New Tank Truck Feature

➤ TO OBVIATE dragging filling hoses to the tops of the huge tank trucks now in use, J. H. DeFrees of Warren, Pa., has filling connections in the bottom of the one on which he has been granted patent 2,423,879. Within, an inverted U-shaped pipe carries the gasoline or other liquid up, then down near the bottom again for discharge. Patent rights are assigned to the Pennsylvania Furnace and Iron Company.

Science News Letter, July 26, 1947

Books of the Week

TO SERVE YOU: To get these books, send us a check or money order to cover retail price. For free publications send 10 cents to cover handling. Address Book Dept., SCIENCE NEWS LETTER, *1719 N St., N. W., Washington 6, D. C.*

ANCIENT PLANTS AND THE WORLD THEY LIVED IN—Henry N. Andrews—*Comstock,* 279 p., illus., $4.50. An introduction to paleobotany to help the present day botanist understand the flora of the world we live in by explaining the derivation of present plant forms from past ones.

APPLIED ARCHITECTURAL ACOUSTICS—Michael Rettinger—*Chemical Pub.,* 188 p., illus., $5.50. A discussion of the progress made in this type of functional design in the past decades, particularly due to the demands of sound studios and theaters. A practical handbook for architect and engineer, it will also serve the student well.

AS YOU SOW—Walter Goldschmidt—*Harcourt,* 288 p., illus., $4. A study of the effects of industrialized agriculture on the traditional rural society and its daily life.

ATOMICS FOR THE MILLLIONS—Maxwell Leigh Eidinoff and Hyman Ruchlis—*McGraw-Hill,* 278 p., illus., $3.50. With simple, understandable illustrations, this explanation of atomic energy can be followed by the reader who has no previous scientific or mathematical training. It also explains what the hopes are for future uses of atomic energy in industry and medicine.

CINEPLASTY—Henry H. Kessler—*Thomas,* 201 p., illus., $6.75. An examination of the subject of fitting the amputee with the best possible prothesis and utilizing the still functioning muscles for its activation.

CLASSIFICATION AND RANGES OF THE GOPHER SNAKES OF THE GENUS PITUOPHIS IN THE WESTERN UNITED STATES—L. M. Klauber—*Zoological Society of San Diego,* Bulletin 22, 81 p., illus., paper, $1.15.

CULTURE COMPLEXES AND CHRONOLOGY IN NORTHERN TEXAS WITH EXTENSION OF PUEBLOAN DATINGS TO THE MISSISSIPPI VALLEY—Alex D. Krieger—*Univ. of Texas,* 366 p., illus., $2.50. An attempt at correlation across the Southwestern and Southeastern parts of the continent, in terms of culture complexes, chronology of Puebloan architecture, and degrees of contact of peoples in these parts.

ELECTRICAL ENGINEERING: Problems and Their Solutions—T. F. Wall—*Chemical Pub.,* 312 p., $5. A companion volume to PRINCIPLES OF ELECTRICAL ENGINEERING, examples have been chosen to emphasize the principles therein dealt with; graded to tax the faculties of the solver.

ENCYCLOPEDIA OF HYDROCABON COMPOUNDS: VOL. II—C6 and C7—Joseph Escott Faraday, compiler—*Chemical Pub.,* 603 p., $17.50. With sturdy loose-leaf binder so that replacement-addition sheets may be quickly inserted, this research aid presents molecular and structural formulae, occurrence in nature, trivial names, methods of preparation, physical constants, properties, and tests for all compounds. An extensive bibliography is included.

GENERAL PLASTICS: Projects and Procedures—Raymond Cherry—*McKnight and McKnight,* 156 p., illus., paper, $1.50. A handicraft book explaining carefully all the procedures used in making articles from plastics. This versatile material lends itself well to working in the home shop.

HANDBOOK OF INDUSTRIAL RADIOLOGY—Members of the Industrial Radiology Group of the Institute of Physics, J. A. Crowtner, ed.—*Edw. Arnold & Co.,* 203 p., illus., $7. Uses of X-ray for flaw detection together with practical information on setting-up the material for exposure and response of photographic materials.

LABOR'S RELATION TO CHURCH AND COMMUNITY—Liston Pope, ed.—*Inst. for Rel. and Social Studies,* 182 p., $2.50. Labor leaders discuss their aims and achievements in relation to the community and the values and faiths by which they live.

MAKING YOUR OWN TELESCOPE—Allyn J. Thompson—*Sky,* 211 p., illus., $3.50. Complete insructions and detailed diagrams for making your first telescope. The one illustrated, made by the author, cost under $30.

MOCHE: A PERUVIAN COASTAL COMMUNITY—John Gillin—*Smithsonian Inst.,* Inst. of Social Anthropology Publ. No. 3, 166 p., illus., paper, $1. Study of a community in the last stages of losing its identity as an Indian group and being absorbed into national Peruvian life.

MODERN POLISHES AND SPECIALTIES—W. D. John—*Chemical Pub.,* 313 p. $7.50. Industrial and household polishes are here thoroughly discussed, starting with the basic raw materials which compose the various types.

POSTWAR RESEARCH IN MELLON INSTITUTE—*Mellon Inst.,* 38 p., illus., paper, free. The Thirty-Fourth Annual Report of the Director, this booklet discusses the activities of the Institute during the year 1946, both accomplishments and projected work.

POWDER METALLURGY—Henry H. Hausner—*Chemical Pub.,* 307 p., $7. The principles of powder metallurgy are explained in the form of tables and graphs. A glossary of terms is included as well as an extensive bibliography. No micrographs to show effects of sintering temperatures and mold pressure, particle size, etc.

PRINCIPLES OF ELECTRICAL ENGINEERING—T. F. Wall—*Chemical Pub.,* 563 p., $8.50. Basic principles outlined with emphasis on those relating to both heavy-current and light-current engineering practise.

A PROGRAM FOR NATIONAL SECURITY—Report of the President's Advisory Commission on Universal Training—*Govt. Printing,* 448 p., paper, 75 cents. The official plea for universal military training. The dozen pages on "Possible Future Warfare" are frightening because they are sober.

RETINAL STRUCTURE AND COLOUR VISION—E. N. Willmer—*Cambridge Univ.,* 231 p., illus., $4.50. A statement of the facts and theories of the phenomena of color vision examined under the present knowledge of physiology for the purpose of stimulating both thought and research in this little understood field.

STEEL CASTINGS—Eric N. Simons—*Chemical Pub.,* 206 p., illus., $5. A simple presentation of pertinent and practical facts relating to the manufacture, properties, and uses of cast steel.

YOUR FARMHOUSE: CUTOUTS TO HELP IN PLANNING—Bureau of Plant Industry, Soils and Agricultural Engineering, Bureau of Human Nutrition and Home Economics, and Extension Service, U.S. Dept. of Agric.—*Govt. Printing,* Misc. Publ. No. 622, 47 p., illus., paper, 25 cents. Cutouts of furniture, accessories, etc. to plan a useful living unit.

Science News Letter, July 26, 1947

OPTICS

Conducting Light Beam

➤ A FLEXIBLE "light pipe," to conduct a small beam of light to the exact spot desired, won patent 2,424,064 for R. F. E. Stegeman of Greece, N. Y. A series of disks of lucite or similar plastic is arranged face to face in a flexible tube, with a projecting endpiece of the same material. The disks conduct light from a lamp at the bottom practically as well as if they were a solid rod, yet the device can be bent freely. Patent rights are assigned to Bausch and Lomb Optical Company.

Science News Letter, July 26, 1947

Standards for Instrument Calibration

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⚙ *LIVE BAIT for fishermen is a wiggling minnow within a tiny elongated pointed cylindrical casing made of a transparent plastic. The fish line is attached to one end and fish hooks to one side and to the other end. The device is effective with bass, pike, pickerel and other game fish.*

Science News Letter, July 26, 1947

⚙ *SPEED VISE for the mechanic's bench is operated hydraulically by foot levers. With a few easy strokes of the foot-operated hydraulic pump, the operator can build up pressures from a feather touch to a seven-ton squeeze, and control jaw action from very fast to very slow.*

Science News Letter, July 26, 1947

⚙ *EXPLOSION-PROOF electric motors, particularly for airplanes, are housed in enclosures with venting windows covered with a new porous metal. The vented construction permits the products of explosion to escape easily, prevents accumulation of combustible gases, and keeps hot products of compression cool.*

Science News Letter, July 26, 1947

⚙ *VISION training instrument resembles the familiar stereoscope but has separate tracks which permit the two pictures to be moved into a variety of positions. The child, as shown in the picture, adjusts the pictures until they merge into one; the scale readings are interpreted by the doctor.*

Science News Letter, July 26, 1947

⚙ *ELECTRONIC DEVICE detects metal particles and other impurities in candy and other foodstuffs as the material being inspected passes before it on an endless conveyor. If contaminated material passes, a lamp is lighted or a bell rung, or the package is automatically deflected into a special channel.*

Science News Letter, July 26, 1947

⚙ *DENTAL COMPACT is a plastic case about the size of a package of cigarettes, within which is space for toothpowder and a folding toothbrush. The handle of the brush is hinged so that it folds back over the rear of the bristle end. It is held open in full-length position by a sliding panel on its rear.*

Science News Letter, July 26, 1947

⚙ *PARKING LAMP for automobiles draws slightly more than one-tenth of an ampere per hour yet gives a steady light visible at 1,000 feet. The standard storage battery, charged for 100 ampere hours, would sustain the light over 900 hours. The three-ounce lamp, with lens of ruby-glass, is easily installed.*

Science News Letter, July 26, 1947

★ **SCIENCE SERVICE BOOK SELECTION**

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This book is one of those chosen from time to time by Science Service for the convenience of its readers, as an outstanding work in its field.

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Where published sources are used they are cited.

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